



December 19, 2008

L-PI-08-099  
10 CFR 50.73

U S Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

Prairie Island Nuclear Generating Plant Unit 2  
Docket 50-306  
License No. DPR-60

LER 2-08-02, Unit 2 Manual Reactor Trip during Low Power Physics Testing

Northern States Power Company, a Minnesota corporation (NSPM) herewith encloses Licensee Event Report (LER) 2-08-02. The LER describes a condition where Prairie Island Nuclear Generating Plant (PINGP) Unit 2 was manually tripped due to a rod control urgent failure alarm and failure of one group of rods to move inward as expected. This occurred during the reactor physics testing portion of startup following PINGP's twenty-fifth, Unit 2 refueling outage (2R25). NSPM notified the NRC of this event as required by 10 CFR 50.72.(b)(2)(iv)(B) on October 30, 2008. Please contact us if you require additional information related to this event.

Summary of Commitments

This letter contains no new commitments and no changes to existing commitments.

A handwritten signature in black ink that reads 'Michael D. Wadley'.

Michael D. Wadley  
Site Vice President  
Prairie Island Nuclear Generating Plant  
Northern States Power Company - Minnesota

Enclosure

cc: Administrator, Region III, USNRC  
Project Manager, Prairie Island, USNRC  
Resident Inspector, Prairie Island, USNRC  
Department of Commerce, State of Minnesota

**ENCLOSURE**

**LICENSEE EVENT REPORT 2-08-02**

**3 Pages Follow**

<b>NRC FORM 366</b> <small>(9-2007)</small>  <b>U.S. NUCLEAR REGULATORY COMMISSION</b>  <div style="text-align: center;"> <b>LICENSEE EVENT REPORT (LER)</b>           (See reverse for required number of          digits/characters for each block)       </div>		<b>APPROVED BY OMB NO. 3150-0104</b>  Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to <a href="mailto:infocollects@nrc.gov">infocollects@nrc.gov</a> , and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0066), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.																																					
<b>1. FACILITY NAME</b> Prairie Island Nuclear Generating Plant Unit 2		<b>2. DOCKET NUMBER</b> 05000306	<b>3. PAGE</b> 1 of 3																																				
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<b>12. LICENSEE CONTACT FOR THIS LER</b> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%;"> <b>NAME</b>          Jorge L. O'Farrill, Licensing Engineer       </td> <td style="width:50%;"> <b>TELEPHONE NUMBER (Include Area Code)</b>          651.388.1121       </td> </tr> </table>				<b>NAME</b> Jorge L. O'Farrill, Licensing Engineer	<b>TELEPHONE NUMBER (Include Area Code)</b> 651.388.1121																																		
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<b>13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT</b> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>CAUSE</th> <th>SYSTEM</th> <th>COMPONENT</th> <th>MANU-FACTURER</th> <th>REPORTABLE TO EPIX</th> <th>CAUSE</th> <th>SYSTEM</th> <th>COMPONENT</th> <th>MANU-FACTURER</th> <th>REPORTABLE TO EPIX</th> </tr> <tr> <td>X</td> <td>AA</td> <td>FU</td> <td>S156</td> <td>Y</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>				CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	X	AA	FU	S156	Y																					
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<b>ABSTRACT</b> (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)  <p>On October 30, 2008, at 1414 CDT during reactor physics testing following a Unit 2 outage, Prairie Island Nuclear Generating Plant (PINGP) Unit 2 was just above the point of adding heat (POAH) when an urgent failure alarm was received while moving Bank A control rods inward. It was noted that Group 1 control rods in Power Cabinet 21AC unexpectedly stopped moving while Group 2 control rods in Power Cabinet 22AC continued inward rod motion. Operators stopped Group 2 control rods and initiated a manual reactor trip. All systems operated as expected following the trip and operator response and recovery actions were as expected.</p> <p>Subsequent troubleshooting identified that a Phase C fuse in the 21AC Moveable Gripper bus duct disconnect switch had blown. Troubleshooting also identified that the blown fuse was not fault related and likely due to a random failure. All 21AC moveable gripper bus duct disconnect switch fuses were replaced on October 31<sup>st</sup>, 2008 at approximately 0031 CDT thereby restoring full functionality of bank A control rods. In addition, all of the moveable gripper bus duct disconnect-switch fuses for the other two power cabinets (22AC and 21BD) in Unit 2 were replaced to ensure that the extent of condition was corrected.</p> <p>Reactor startup and physics testing were resumed on October 31, 2008 at 1115 and Unit 2 reactor was returned to criticality on October 31, 2008 at 1311 CDT.</p>																																							

**LICENSEE EVENT REPORT (LER)**  
**CONTINUATION SHEET**

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**EVENT DESCRIPTION**

On October 30, 2008 PINGP was in the process of a Unit 2 reactor startup following a scheduled refueling outage. The reactor was critical and was slightly above the POAH when at 1414 CDT a rod control system<sup>1</sup> urgent failure alarm was received. At this point, PINGP operators were performing reactor physics testing for control rod bank A, which required both rod control groups 1 and 2 to be inserted. When the urgent failure alarm was received, operators noted that group 1 stopped moving while group 2 continued inward motion. Operators immediately stopped group 2 control rods and based on plant conditions at the time, operations personnel initiated a manual reactor trip of PINGP Unit 2. The manual trip was initiated since power was decreasing with low power conditions present. All control rods fully inserted as expected and all operator actions were as expected for the reactor trip. The event is being reported as required by 10 CFR 50.73(a)(2)(iv)(A) due to the manual actuation of the reactor protection system.

**EVENT ANALYSIS**

One of the Reactor Protection System<sup>2</sup> design functions is to prevent or suppress conditions that could result in exceeding acceptable fuel damage limits by opening the reactor trip breakers and allowing all control rods to fall inward. This rapid insertion of rods creates negative reactivity which causes a rapid reactivity shutdown. When operators manually tripped the reactor, all control rods fully inserted as expected. Therefore, the reactor protection system operated as designed and there was no loss of safety function per 10 CFR 73(a)(2)(v).

**SAFETY SIGNIFICANCE**

The reactor protection system is designed so that reactor shutdown with rods is completely independent of the normal rod control functions since the reactor trip breakers completely interrupt power to the rod latching mechanisms regardless of existing control signals. When operators manually initiated the reactor trip, all control rods fully inserted as expected. For these reasons this event was of low safety significance.

**CAUSE**

It was not known at the time of the trip, but subsequent troubleshooting isolated the cause of the rod control urgent failure alarm and failure of control bank A group 1 rods to insert to a phase C fuse failure in the 21AC power cabinet moveable gripper bus duct disconnect switch. This fuse provides power to the moveable gripper assemblies in power cabinet 21AC. Troubleshooting was unable to determine a fault that would cause the fuse to blow and the apparent cause was determined to be a random fuse failure.

**CORRECTIVE ACTION**

The blown fuse along with all of the moveable gripper bus duct disconnect-switch fuses for each power cabinet was replaced on Unit 2. This restored the full functionality of Unit 2 control rods. Troubleshooting and repairs were completed on October 31, 2008 at approximately 0031 CDT. At 1115 CDT, PINGP resumed Unit 2 startup and the reactor was successfully restored to criticality on October 31, 2008, at 1311 CDT.

<sup>1</sup> EEIS Component Identifier: AA

<sup>2</sup> EEIS Component Identifier: JC

# LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

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In order to correct the extent of condition, a preventative maintenance program to replace all of the bus duct fuses in both PINGP Unit 1 and Unit 2 every 10 years will be implemented. In addition, all of the bus duct fuses for Unit 1 will be replaced during the next refueling outage.

## PREVIOUS SIMILAR EVENTS

Three reactor trip events were found under LER 1-06-01, LER 2-07-01, and LER 1-08-02. LER 1-06-01 describes a manual reactor trip initiated due to a ground in a condensate pump, LER 2-07-01 was an automatic reactor trip caused by a failed safety injection relay, and LER 1-08-02 was an automatic reactor trip caused by a failed reactor protection controller during testing.

Although similar in that they all describe reactor trips related to equipment problems, they are not significant with regard to the subject event because each equipment problem was significantly different.